

1. Additional test A

Ink compositions of examples 14-17, comparative examples 10 and 11, and example 1 were prepared in the mixing proportions shown in Table 5 according to the first preferable form of the present invention.

A printed article was prepared using each of the ink compositions described in examples 14-17, comparative examples 10 and 11, and example 1 according to the first preferable form of the present invention, and those printed articles are evaluated for ozone resistance, nitrogen oxide resistance, and clogging resistance. In this test, three exposure times, i.e., six hours, 12 hours, and 24 hours, were provided for ozone resistance evaluation, and two non-use periods (for which the printer was left unused), i.e., two weeks and one month, are provided for clogging resistance evaluation.

The obtained evaluation results are shown in FIG. 6.

2. Additional test B

Ink compositions of example 18 and example 9 were prepared in the mixing proportions shown in Table 7 according to the second preferable form of the present invention.

A printed article is prepared using each of the ink compositions described in example 18 and example 9 according to the second preferable form of the present invention, and those printed articles were evaluated for ozone resistance, nitrogen oxide resistance, and clogging resistance. In this test, two non-use periods (for which the printer was left unused), that is, two weeks and one month, are provided for clogging resistance evaluation.

The obtained evaluation results are shown in FIG. 8.

The results of example 14 and comparative example 1, example 15 and comparative example 10, and example 18 and example 9 show that Na salt exhibits poor recoverability when the printer is left unused for longer periods, while Li salt maintains good recoverability even when the printer is left unused for longer periods. It is evident from the comparison with comparative example 11 that in comparative example 10, clogging resistance is lowered by the addition of an additive, and it can easily be judged from the results of example 15, comparative example 10, and comparative example 11 that Li salt is effective in improving ozone resistance while maintaining this good clogging resistance.

Table 5

	Examples					Comparative	
	14	15	16	17	17	Ex1	
Colorant	C.I. Direct Blue199(*1)						
Solvents et	Glycerol	1	3	0.5	0.5	1	1
	Triethylene glycol	10		3	3	10	10
	2-pyrrolidone	10		15	15	10	10
	Triethanolamine			0.5	0.5		
	Diethylene glycol monobutyl ether	1		0.5	0.5	1	1
	Triethylene glycol monobutyl ether						
	Olfine E1010(*2)	10		12	12	10	10
	Propylene glycol	1	1	0.5	0.5	1	1
	1,2,6-hexanetriol		8				
	Urea		7				
Additives	Disodium naphthalene-1,5-disulfonate		6				3
	Dilithium naphthalene-1,5-disulfonate						
	10% water solution	30	20				
	Figure in parentheses indicates solid content	(3)	(2)				
	Dilithium benzene-1,3-disulfonate 10% water solution			5	1		
Others	Figure in parentheses indicates solid content			(0.5)	(0.1)		
	Proxel XL-2(*3)	0.3		0.3	0.3		0.3
Water				Remainde			
Ratio between colorant and aromatic sulfonic acid/s		1:3	3:2	1:1	1:0.2		1:3

*1:Colorant having absorption wavelengths as shown in FIG. 1 used

*2:Made by Nissin Chemical Industry Co., Ltd.

*3:Made by Avecia Ltd.

Table 7

		Examples	Comparative
		18	Ex9
Colorant	C.I. Direct Blue 86(*4)	1	1
Solvents et	Glycerol	5	5
	Triethylene glycol	5	5
	Triethanolamine	1	1
	Triethylene glycol monobutyl ether	10	10
	Olfine PD001(*5)	1	1
Additives	Disodium naphthalene-2,6-disulfonate		4
	Dilithium naphthalene-2,6-disulfonate	40	
	10% water solution	(4)	
Others	Figure in parentheses indicates solid co		
	Proxel XL-2(*6)	0.3	0.3
	Water	Remainder	
Ratio between colorant and aromatic sulfonic acid/s		1:4	1:4

*4:Colorant having absorption wavelengths as shown in FIG. 2 used

*5:Made by Nissin Chemical Industry Co., Ltd.

*6:Made by Avecia Ltd.

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